

changing "similar" to --equal--. The claims as amended now include a single dose of approximation, which has long been accepted with terms such as "about" and "substantially" allowed in claim language. Support in the specification for the language "substantially equal" is found in the specification on page 6, lines 2-5.

Claims 4, 5, 25, and 26 have been amended to eliminate the term "levitating" which modifies "magnetic forces". Since the magnetic forces cause the levitation of the impeller, the claims, as amended, read "magnetic forces levitating said impeller". Support in the specification for the language "magnetic forces levitating said impeller" is found in the specification on page 16, lines 18-21.

Claim 7 and 29 have been amended to eliminate the article "the" in front of "fluid" and replace it with the article "a". Consequently, the claims as amended do not lack antecedent basis.

Claims 4-7 and 25-29 are not anticipated (§102) by Bramm et al. (4,944,748) because Bramm et al. does not teach diamagnets in any component, fixed or rotating, of the pump shown. The reference is completely devoid of any such teaching. Consequently, claims 4-7 and 25-29, each of which calls for diamagnets in the impeller, clearly do not read on Bramm et al. Consequently, the rejection of these claims as anticipated (§102) by Bramm et al. should be withdrawn.

Claims 4-7¹ and 25-29 are not obvious (§103) over Bramm et al. because Bramm et al. does not disclose the use of diamagnetic materials as a solution to Earnshaw's theorem. Bramm et al. recognizes that a suspension system comprised

¹/Applicant assumes the Examiner intended to reject claims 4-7 as obvious (§103) because the Examiner rejected claims 4-7 as anticipated (§102).

solely of permanent magnets cannot be stable, which is based on Earnshaw's theorem. To solve the problems imposed by Earnshaw's theorem, Bramm uses an electromagnet 70 in the housing 44 to provide axial stability to the structure. Radial stability was provided by the permanent magnets placed in the impeller 42 and the housing 44. If using diamagnets, electromagnets, and permanent magnets were obvious, then Bramm et al. would have mentioned the use of diamagnets. Bramm et al. does not suggest the use of diamagnets in his invention. Consequently, applicant's recognition of the use of diamagnets in a fluid pump with magnetically levitated impeller is inventive.

Applicant has complied with or obviated by amendment each of the bases for rejection of the claims on technical grounds and has pointed out the clear lack of anticipation of the claims in the case by Bramm et al. Applicant has also pointed out when the claims are not obvious over Bramm et al.

Consequently, the claims appear to be allowable and a Notice of Allowability is requested.

Dated: 3/18/94

Respectfully submitted,

By 

Eugene L. Johnson
Reg. No. 21,028
Dorsey & Whitney
Pillsbury Center South
220 South Sixth Street
Minneapolis, MN 55402-1498